

14. (Not Amended Herein) A recording method according to Claim 1, wherein the ink has a first polarity and the processing liquid has a second polarity opposite from the first polarity.

15. (Not Amended Herein) A recording method according to Claim 1, wherein a concentration of a surface-active agent in the processing liquid is not less than the critical micelle concentration of the surface-active agent in pure water.

16. (Not Amended Herein) A recording method according to Claim 1 or 15, wherein a concentration of a surface-active agent in the ink is less than the critical micelle concentration of the surface-active in pure water.

#### REMARKS

Claims 1-16 are pending in this application, with Claims 1-3, 8 and 10 being independent. Claims 2, 3, 5, 8, 10 and 14-16 have been withdrawn from consideration. Claims 1, 4, 6, 7 and 9 are amended herein to more clearly recite the features of the present invention. Support for the amendments may be found in the substitute specification at least at page 13, [0061] to page 14, [0067]. Applicants respectfully submit that no new matter has been added.

#### *Response to Restriction Requirement*

The Examiner has imposed a restriction requirement on Claims 14-16 added in the Amendment filed on May 28, 2002. Claims 14-16 were said to be directed to a non-elected invention and have been withdrawn from consideration.

Applicants respectfully request that the Restriction Requirement be withdrawn. It is respectfully submitted that Claims 14-16 are dependent upon Claim 1 and the claims could be searched with the elected claims by one Examiner without undue effort. It is also respectfully submitted that it is not mandatory to make a restriction or election of species requirement in every possible situation. It is believed that the examination of all of the claims at one time by one Examiner in the present application will best ensure uniform prosecution quality. Therefore, in the interest of prosecution economy of time and quality for both the Office and Applicants, it is respectfully submitted that withdrawal of the restriction requirement and examination of Claims 14-16 with the elected claims on their merits are appropriate and such actions are respectfully solicited.

#### *Response to Double Patenting Rejections*

Claims 1 and 9 were rejected under the judicially created doctrine of double patenting as allegedly being unpatentable over Claims 16 and 35 of U.S. Patent No. 6,379,000. Claims 1, 4, 6, 7, 9 and 11-13 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over Claims 1-4 and 6-31 of copending Application No. 09/131,736. Applicants respectfully traverse these rejections.

Claims 16 and 35 of U.S. Patent No. 6,379,000 are directed to a method comprising forming an image using different plural liquids, wherein a  $K_a$  value of at least one of said different plural liquids is not less than  $5 \text{ (ml.m}^{-2}\text{.msec}^{-1/2})$  and a  $K_a$  value of at least one other of said different plural liquids is less than  $5 \text{ (ml.m}^{-2}\text{.msec}^{-1/2})$ .

Claims 1-4 and 6-31 of copending Application No. 09/131,736 are directed to an ink jet recording method comprising a recording step of recording by ejecting ink to a predetermined region on a recording material and a heating step of heating the region,

wherein the ink has an ink absorption coefficient  $K_a$  ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ ) relative to a plain paper, defined by Bristow method, is 1.0-5.0, and satisfies  $0 < t_s \leq 200 \text{ msec}$ , where  $t_s$  is a rapid expansion start point.

In contrast, independent Claim 1 of the present invention recites a recording method for recording on a recording material using an ink containing a coloring material and a processing liquid for making the coloring material insoluble, comprising a step of ejecting onto the recording material the ink, said ink having a  $K_a$  value of a first value; and a step of applying the processing liquid having a  $K_a$  value of a second value larger than the first value, onto the recording material, wherein the processing liquid is applied onto the recording material after a rapid swell start point  $t_s$  passes after penetration of the ink into the medium so that the processing liquid is overlapped with the ink ejected on the recording material. Applicants submit that independent Claim 1 and its dependent claims are patentably distinct from Claims 16 and 35 of U.S. Patent No. 6,379,000, and Claims 1-4 and 6-31 of copending Application No. 09/131,736. Accordingly, withdrawal of the double patenting rejections is respectfully requested.

#### *Response to Other Rejections*

Claims 1, 4, 7, 9 and 11-13 were rejected under 35 U.S.C. § 102(b), as allegedly anticipated by Koike et al. (U.S. Patent No. 5,608,438). Claims 1, 7, 9 and 11-13 were rejected under 35 U.S.C. § 102(b), as allegedly anticipated by Yamamoto et al. (EP 0 588 241 A2). The rejection of Claim 1 as anticipated by Hirose (U.S. Patent No. 591,514) at line 2 of page 6 of the Office Action is an error and can be disregarded, according to a telephone conference with the Examiner on September 27, 2002. Claims 1 and 6 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Shioya et al. (EP 726148) in view of both Kimura et al. (U.S.

Patent No. 5,955,515) and Koike et al. (U.S. Patent No. 5,614,931). Applicants respectfully disagree with these rejections as applied to the present claims.

As discussed above, the present invention, as recited in independent Claim 1, relates to a recording method for recording on a recording material using an ink containing a coloring material and a processing liquid for making the coloring material insoluble, comprising a step of ejecting onto the recording material the ink, said ink having a Ka value of a first value; and a step of applying the processing liquid having a Ka value of a second value larger than the first value, onto the recording material, wherein the processing liquid is applied onto the recording material after a rapid swell start point ts passes after penetration of the ink into the medium so that the processing liquid is overlapped with the ink ejected on the recording material.

Koike et al. (U.S. Patent No. 5,608,438) relates to an ink jet recording method comprising jetting a first ink having a Ka value of 0.5 or smaller and jetting a second ink having a Ka value of 1.0 or larger. However, Koike et al. does not teach or suggest the use of a processing liquid for making the coloring material insoluble in the recording method.

Yamamoto et al. relates to an ink jet recording method comprising providing a black ink having a surface tension of not less than 40 dyne/cm and containing a first dye, and providing at least one color ink having a surface tension of not more than 40 dyne/cm and containing a dye which is rendered insoluble by the first dye. However, Yamamoto et al. does not teach or suggest applying a processing liquid onto the recording material after a rapid swell start point ts passes after penetration of the ink into the medium so that the processing liquid is overlapped with the ink ejected on the recording material.

Shioya et al. provides an ink-jet printing method for ejecting an ink and a liquid containing at least a material which insolubilizes or coagulates a coloring material in the ink.

However, Shioya et al. does not teach or suggest applying a processing liquid onto the recording material after a rapid swell start point is passed after penetration of the ink into the medium so that the processing liquid is overlapped with the ink ejected on the recording material.

Applicants submit that neither of the above-discussed references teaches or suggests the aforementioned features of the claimed invention. Accordingly, Applicants conclude that these references do not anticipate or render obvious the present invention as recited in independent Claim 1.

Applicants also submit that the secondary references Kimura et al. and Koike et al. (U.S. Patent No. 5,614,931), cited for teaching that diffusion values are a conventional concern in the art for they control such properties as the feathering and bleeding of the liquid, do not teach or suggest the aforementioned features of the claimed invention, either. Thus, they do not remedy the deficiencies of Shioya et al.

For the foregoing reasons, Applicant submits that the present invention, as recited in independent Claim 1, is patentably defined over the cited references, whether taken singly or in the combinations proposed by the Examiner. The dependent claims are also submitted to be patentable for the reasons given regarding independent Claim 1, as well as for the patentable features recited therein. Individual consideration of the dependent claims is requested.

Applicant believes that the instant application is in condition for allowance. Favorable consideration, withdrawal of the rejection and issuance of an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our address given below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'L. Stahl', written over a horizontal line.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Three Times Amended) A recording method for recording on a recording material using an ink containing a coloring material and a processing liquid for making the coloring material insoluble, comprising:

a step of ejecting onto [a] the recording material the ink, said ink having a Ka value of a first value; and

a step of applying [to the ink deposited on the recording material, a] the processing liquid having a Ka value of a second value larger than the first value, onto the ink ejected on the recording material [to insolubilize a coloring material in the ink inside the recording medium],

wherein the processing liquid is applied onto the recording material [to the ink] after a rapid swell start point ts passes after penetration of the ink into the medium so that the processing liquid is overlapped with the ink ejected on the recording material.

4. (Twice Amended) An apparatus according to Claim 1 [or 3], further comprising the step of applying heat to a reaction product of the ink and the processing liquid after said processing liquid applying step.

6. (Amended) A method according to Claim 1 [or 5], wherein the ink contain pigment.

7. (Twice Amended) A method according to Claim 1 [or 6], wherein the ink includes a black ink and a color ink, the black [wherein] ink having a  $K_a$  value of not more than  $3 \text{ (ml.m}^{-2}\text{.msec}^{-1/2}\text{)}$  [is the black ink] and the color ink having a  $K_a$  value of not less than  $5 \text{ (ml.m}^{-2}\text{.msec}^{-1/2}\text{)}$ , and after application of the processing liquid having a  $K_a$  value of not less than  $5 \text{ (ml.m}^{-2}\text{.msec}^{-1/2}\text{)}$ , the color ink is [deposited] ejected.

9. (Twice Amended) A method according to Claim 1 [or 8], wherein the ink and the processing liquid are ejected to the recording material by generating a bubble by application of thermal energy to the ink and to the processing liquid.